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10/722,563	11/28/2003	Naoki Yoshimura	PTGF-03095	6265

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EXAMINER

MONDT, JOHANNES P

ART UNIT	PAPER NUMBER
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3663

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/722,563

Applicant(s)

YOSHIMURA ET AL.

Examiner

Johannes P. Mondt

Art Unit

3663

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 16 July 2007.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-5, 13-16 and 18-32 is/are pending in the application.
- 4a) Of the above claim(s) 19-26, 30 and 31 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-5, 13-16, 18, 27-29 and 32 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
- 1) ☒ Certified copies of the priority documents have been received.
 - 2) ☐ Certified copies of the priority documents have been received in Application No. _____.
 - 3) ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____.

DETAILED ACTION

Response to Amendment

Amendment filed 7/16/07 forms the basis for this Office Action. In said Amendment applicant substantially amended the claim language by adding new claims 28-32. Comments on Remarks are included below under "Response to Arguments".

Election/Restrictions

It is noted herewith that newly added claims 30 and 31 depend on withdrawn claims 19 and 20, respectively, and hence are being withdrawn from consideration.

Specification

The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

1. *The Specification* is objected to because the composition of the "sialon system phosphor powder" (line 6 of claim 1 and pages 20-25 of the Specification; particularly paragraphs [0142]-[0153] of the published application US 2005/0001225 A1) limited by the range of the weight percentage of α -sialon (40% or more and 90% or less) is in contradiction to the chemical composition of the "entire phosphor powder", leaving aside the specific interpretation of said entire phosphor powder (see under 35 USC 112, second paragraph, below). Specifically, the value ranges for a and b determine how much Ca and M there can possibly be in the total mixture, let alone in the entire phosphor powder. A

weight percentage of 40 for α -sialon, even when nearly all of the Ca is replaced by M=Yb (which would yield the higher weight percentage for α -sialon) would yield a weight percentage for the maximal value of parameter 'a' ($= 4 \times 10^{-2}$) of $30.52/140 \times 100 < 15$ weight% in terms of the un-reacted silicon nitride (Si_3N_4) alone, and even a lower percentage of the sialon system powder of which said un-reacted Si_3N_4 is a part. This yields a contradiction because 15 does not fall in the range 40 or higher and 90 or lower. Use has been made of the following molar weights: of N: 14, of O: 16, of Yb: 173, of Al: 27, and of Si: 28. See, for instance Periodic Table "Atomic Properties of the Elements"; NIST SP-966 (September 2003).

In conclusion, the teaching of the chemical composition in [0153] contradicts the weight% values for the phosphor mixture discussed in [0142]-[0153]. This inner contradiction implies a lack of utility and a lack of enablement for the disclosed chemical composition.

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. The Specification is objected to because the above-noted incompatibility of the ranges of composition of the sialon system phosphor powder in weight% with the chemical composition of the entire phosphor powder (pages 23-25 and claims 1 and 13) renders the meets and bounds of the disclosed subject matter indefinite.

Claim Rejections - 35 USC § 112

The following is a quotation of the first paragraph of 35 U.S.C. 112:

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The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

3. **Claim 13** is rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim contains subject matter not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention. The reasons for this rejection are the same as the reasons for the objection to the Specification under 35 USC 112, first paragraph, for lack of enablement as explained above.

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

4. **Claim 13** is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. The reasons for this rejection are the same as those for the objection to the Specification under 35 USC 112, second paragraph detailed above.
5. **Claim 13** is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Claim 13 recites the limitation "the entire phosphor" in line 2. There is insufficient antecedent basis for this limitation in the claim.

Claim Rejections - 35 USC § 101

35 U.S.C. 101 reads as follows:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

1. ***Claim 13*** is rejected under 35 U.S.C. 101 because the claimed invention is not supported by either a credible asserted utility or a well-established utility.

The reasons for this rejection are the same as the reasons for the objection to the Specification under section 1 above.

2. ***Claim 13*** also rejected under 35 U.S.C. 112, first paragraph. Specifically, since the claimed invention is not supported by either a credible asserted utility or a well established utility for the reasons set forth above, one skilled in the art clearly would not know how to use the claimed invention.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

1. ***Claims 1-5, 13, 27 and 28*** are rejected under 35 U.S.C. 103(a) as being obvious over Mitomo et al (6,632,379 B2) (as cited previously) in view of either Ellens et al (US 2003/0052595 A1) (previously cited) or Takahashi et al (US 2002/0043926 A1).

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The applied reference has one of its two assignees (National Institute for materials Science) and three common inventors (Mitomo, Endo and Komatsu) in common with the instant application. Based upon the earlier effective U.S. filing date of the reference, it constitutes prior art only under 35 U.S.C. 102(e). This rejection under 35 U.S.C. 103(a) might be overcome by: (1) a showing under 37 CFR 1.132 that any invention disclosed but not claimed in the reference was derived from the inventor of this application and is thus not an invention "by another"; (2) a showing of a date of invention for the claimed subject matter of the application which corresponds to subject matter disclosed but not claimed in the reference, prior to the effective U.S. filing date of the reference under 37 CFR 1.131; or (3) an oath or declaration under 37 CFR 1.130 stating that the application and reference are currently owned by the same party and that the inventor named in the application is the prior inventor under 35 U.S.C. 104, together with a terminal disclaimer in accordance with 37 CFR 1.321(c). This rejection might also be overcome by showing that the reference is disqualified under 35 U.S.C. 103(c) as prior art in a rejection under 35 U.S.C. 103(a). See MPEP § 706.02(l)(1) and § 706.02(l)(2).

On claims 1 and 28: Mitomo et al teach a light emitting apparatus (title, abstract and columns 1-12, i.p. col. 5) comprising: a light emitting element with an emission wavelength in a range of 360 nm to 550 nm (column 1, line 62); and a rare earth element doped oxide nitride phosphor (see abstract), wherein a part of the light radiated from the light emitting element is wavelength-converted by the phosphor (column 1, line 5 – column 2, line 46), and the phosphor comprises a sialon system phosphor powder comprising α -sialon of weight percentage (as ratio of total weight) in the range between 40 weight % to 90 weight % (Example 9, column 3, lines 21-30; column 11, lines 5-20 and abstract) (namely: 68 weight %), the α -sialon being structured such that a Ca site of Ca- α -sialon represented by $(\text{Ca}_x\text{M}_y) \text{Si}_{1-z1}\text{Al}_{z1}\text{O}_{1-z2}\text{N}_{z2}$ ($0 \leq z_n \leq 1$, $n=1,2$) is partially replaced by metal (M) β -sialon of a weight % (as percentage of total phosphor weight) between 40% and 90% (namely: 68% (abstract and Example 9, column 11, line 5-20), and un-reacted silicon nitride of a weight % (as percentage of totals phosphor weight) of 30% or less, where M comprises metal that is one or more selected from Ce, Pr, Eu, Tb, Yb, and Er, namely: among Eu, Tb, Yb and Er, e.g., Eu (Example 9, column 11, lines 5-20) and $0.05 < (x+y) < 0.3$, $0.02 < x < 0.27$ and $0.03 < y < 0.3$ (namely: $x=0.11$ and $y=0.06$).

Mitomo et al do not necessarily teach the limitation that said light-emitting element comprises a reflection layer.

However, it would have been obvious to include said limitation in view of *Ellens*, who, in a light-emitting element with sialon phosphor (see e.g. abstract and paragraphs [0004]-[0005]), hence analogous art, teach the inclusion of a light reflection layer 17 (see [0025]). *Motivation* to include the teaching by *Ellens* in this regard is the improved efficiency in the use of the primary light reflected by said reflection layer, through an increase in the path length through said phosphor and through improved focus of light emission.

Alternatively, it would have been obvious to include said limitation in view of *Takahashi et al*, who, in a light-emitting element with sialon phosphor (see e.g. abstract), hence analogous art, teach the inclusion of a light reflection layer 25 between the light-emitting layer 14 and the substrate 11 (see [0077][0078] and Figure 3), thus also meeting claim 28. *Motivation* to include the teaching by *Takahashi et al* in this regard is the improved efficiency in the use of the primary light reflected by said reflection layer, through an increase in the path length through said phosphor and through improved focus of light emission.

On claim 2: the emission wavelength is in the range of 450 nm to 550 nm ((namely: 450 – 550 nm) (col. 1); and the light emitting apparatus radiates white light (col. 1, l. 5-15) generated by a mixture of the wavelength-converted light and an other part of light radiated from the light emitting element (the latter limitation being satisfied because inherently the probability of conversion for any single primarily excited photon

is governed by Lambert's Law [see, e.g., M. Fukuda, "Optical Semiconductor Devices", Wiley Series in Microwave and Optical Engineering (1999), page 42], which is exponential).

On claim 3: the oxide nitride phosphor comprises an oxide nitride that contains the α -sialon as a matrix material (column 1, lines 14-20 and cols. 5-6).

On claim 4: the phosphor comprises a powder or particle (col. 3, l. 21-30) and is contained in a light transmitting material (as otherwise light could not be emitted by the phosphors as light output resulting in white light, the primary emission being in the blue/UV part of the spectrum).

On claim 5: the light-emitting element comprises a group II nitride system compound semiconductor light emitting element (column 1).

On claim 13: noting the lack of enablement (under 112, first paragraph, see above) and not implying enablement in Mitomo et al, the further limitation defined by claim 2 in Mitomo et al (see also col. 7, l. 18-23) anticipates this claim.

On claim 27 and 32: Mitomo et al teach a light emitting apparatus (title, abstract and columns 1-12, i.p. col. 5) comprising: a light emitting element with an emission wavelength in a range of 360 nm to 550 nm (column 1, line 62); and a rare earth element doped oxide nitride phosphor (see abstract), wherein a part of the light radiated from the light emitting element is wavelength-converted by the phosphor (column 1, line 5 – column 2, line 46), and the phosphor comprises a sialon system phosphor powder comprising:

α -sialon of weight percentage (as ratio of total weight) in the range between 40 weight % to 90 weight % (Example 9, column 3, lines 21-30; column 11, lines 5-20 and abstract) (namely: 68 weight %), the α -sialon being structured such that a Ca site of Ca- α -sialon represented by $(\text{Ca}_x\text{M}_y)\text{Si}_{1-z1}\text{Al}_{z1}\text{O}_{1-z2}\text{N}_{z2}$ ($0 \leq z_n \leq 1$, $n=1,2$) is partially replaced by metal (M);

β -sialon of a weight % (as percentage of total phosphor weight) between 5% and 40% (namely: 24% (abstract and Example 9, column 11, line 5-20), and

un-reacted silicon nitride of a weight % (as percentage of totals phosphor weight) of 5 weight% or more and 30 weight% or less (namely: 8 weight%), where M comprises metal that is one or more selected from Ce, Pr, Eu, Tb, Yb, and Er, namely: among Eu, Tb, Yb and Er, e.g., Eu (Example 9, column 11, lines 5-20) and $0.05 < (x+y) < 0.3$, $0.02 < x < 0.27$ and $0.03 < y < 0.3$ (namely: $x=0.11$ and $y=0.06$).

Mitomo et al do not necessarily teach the limitation that said light-emitting element comprises a reflection layer.

However, it would have been obvious to include said limitation in view of Ellens, who, in a light-emitting element with sialon phosphor (see e.g. abstract and paragraphs [0004]-[0005]), hence analogous art, teach the inclusion of a light reflection layer 17 (see [0025]). Motivation to include the teaching by Ellens in this regard is the improved efficiency in the use of the primary light reflected by said reflection layer, through an increase in the path length through said phosphor and through improved focus of light emission.

Alternatively, it would have been obvious to include said limitation in view of Takahashi et al, who, in a light-emitting element with sialon phosphor (see e.g. abstract), hence analogous art, teach the inclusion of a light reflection layer 25 between the light-emitting layer 14 and the substrate 11 (see [0077]-[0078] and Figure 3), thus also meeting claim 32. Motivation to include the teaching by Takahashi et al in this regard is the improved efficiency in the use of the primary light reflected by said reflection layer, through an increase in the path length through said phosphor and through improved focus of light emission.

2. **Claims 14-16, 18 and 29** are rejected under 35 U.S.C. 103(a) as being unpatentable over Mueller et al (6,717,353 B1) in view of either Ellens et al (previously cited) or Takahashi et al (US 2002/0043926 A1).

On claims 14 and 29: Mueller et al teach a light emitting apparatus (see title), comprising: a light-emitting element with an emission wavelength in a range (comprising a blue and UV range [see column 1, lines 10-36 and abstract, final sentence], the blue range of the electromagnetic spectrum being between 455 nm and 492 nm; see Academic Press Dictionary of Science and Technology; see also the ultraviolet range, which also overlaps the range as claimed, namely: wavelengths less than about 380 nm; see again Academic Press Dictionary of Science and Technology) that substantially overlaps with the range (360 nm – 550 nm) as claimed; and a cerium-ion doped lanthanum silicon nitride phosphor (column 4, line 61 – column 5, line 22), wherein a part of light radiated from the light-emitting element is wavelength converted by the phosphor (column 4, line 64), a doping amount x ("x" here being interpreted as the

stoichiometric ratio of cerium divided by the total stoichiometric parameter of cerium and (i.e., plus) lanthanum within said cerium-ion doped lanthanum silicon nitride), x being in the range between 0.01 and .5 (column 5, line 3: N.B.: " x " of applicant corresponds to a of Mueller et al, being the stoichiometric parameter defined above); said range for " x " thus substantially overlapping the range as claimed ($0.0 < x < 0.2$), while, to teach a range end points must be at least infinitesimally close to the invention as reduced to practice; hence Mueller et al at least teach one data point for said stoichiometric parameter known to correspond to an electron beam excitation phosphor, i.e., within the range $0.0 < x < 0.2$.

Applicant is reminded that a *prima facie* case of obviousness typically exists when the ranges of a claimed composition overlap the ranges disclosed in the prior art or when the ranges of a claimed composition do not overlap but are close enough such that one skilled in the art would have expected them to have the same properties. In re Peterson, 65 USPQ2d 1379 (CA FC 2003).

Mueller et al do not necessarily teach the further limitation of a reflection layer.

However, it would have been obvious to include said limitation in view of Ellens, who, in a light-emitting element with sialon phosphor (see e.g. abstract and paragraphs [0004]-[0005]), hence analogous art, teach the inclusion of a light reflection layer 17 (see [0025]). Motivation to include the teaching by Ellens in this regard is the improved efficiency in the use of the primary light reflected by said reflection layer, through an increase in the path length through said phosphor and through improved focus of light emission.

Alternatively, it would have been obvious to include said limitation in view of Takahashi et al, who, in a light-emitting element with sialon phosphor (see e.g. abstract), hence analogous art, teach the inclusion of a light reflection layer 25 between the light-emitting layer 14 and the substrate 11 (see [0077]-[0078] and Figure 3), thus also meeting claim 29. Motivation to include the teaching by Takahashi et al in this regard is the improved efficiency in the use of the primary light reflected by said reflection layer, through an increase in the path length through said phosphor and through improved focus of light emission.

Finally, on the basis of the teaching of at least one embodiment with ax in the claimed range said phosphor, being a cerium-doped lanthanum silicon nitride phosphor, is an electron beam excitation phosphor at least according to the definition thereof in the specification.

On claim 15: said phosphor is represented by $\text{La}_{1-x}\text{Si}_x\text{N}_5\text{:}_x\text{Ce}$ (column 5, line 1 and line 3, Mueller's "a" being the relevant stoichiometric parameter as defined above as "x") where the doping amount x is $0 < x < 1$ (loc.cit.), and cerium ion is doped to a lanthanum site in a solid dissolution replacement (because otherwise "sites" such as for lanthanum do not exist).

On claim 16: a doping amount x is $0.1 < x < 0.5$ (column 5, line 3), and the phosphor comprises an UV excitation phosphor (UV light is emitted too from the light-emitting element (see abstract, final sentence and column 4, line 61 – column 5, line 6).

On claim 18: the phosphor by Mueller et al radiates blue light (column 4, line 64 – column 5, line 3).

Double Patenting

The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory obviousness-type double patenting rejection is appropriate where the conflicting claims are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., *In re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent either is shown to be commonly owned with this application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement.

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

3. **Claims 1 and 13** are rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 12 and 13, respectively, of U.S. Patent Application No. 11/717,050 in view of either Ellens et al (previously cited) or Takahashi et al (US 2002/0043926 A1).

Claim 12 of co-pending Application 11/717,050 recites all limitations except the lower limits of β -sialon and un-reacted silicon nitride, and the reflection layer. Said lower limits clearly pertain to the invention as disclosed in the Specification and hence pertain to the invention.

Said reflection layer would have been obvious over Ellens et al (US 2003/0052595 A1), who, in a patent drawn to a light-emitting element with sialon phosphor (see e.g. abstract and paragraphs [0004]-[0005]), hence analogous art, teach the inclusion of a light reflection layer 17 (see [0025]). *Motivation* to include the teaching by Ellens in this regard is the improved efficiency in the use of the primary light reflected by said

reflection layer, through an increase in the path length through said phosphor and through improved focus of light emission.

Said reflection layer would also have been obvious over Takahashi et al (US 2002/0043926 A1), who, in a patent drawn to a light-emitting element with sialon phosphor (see e.g. abstract and paragraphs [0004]-[0005]), hence analogous art, teach the inclusion of a light reflection layer 25 (Figure 3) in the light-emitting element between the light-emitting layer 14 and the substrate 11 (see [0077]-[0078]). *Motivation* to include the teaching by Takahashi et al in this regard is the improved efficiency in the use of the primary light reflected by said reflection layer, through an increase in the path length through said phosphor and through improved focus of light emission. Claim 13 of the present application and claim 13 of 11/717,050 are verbatim the exact same further limitations dependent upon double-patenting claims 1 and 12, respectively, and hence also are rejected.

This is a provisional obviousness-type double patenting rejection.

4. **Claims 1 and 13** are rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1 and 2, respectively, of U.S. Patent No. 6,632,379 (to Mitomo et al) in view of either Ellens et al (previously cited) or Takahashi et al (US 2002/0043926 A1).

Claim 1 of USPAT 6,632,379 to Mitomo et al recites all limitations of claim 1 of the current Application except the light-emitting apparatus with light-emitting element with emission wavelength in the range of 360 nm to 550 nm, the lower limits of β -sialon and un-reacted silicon nitride, and the reflection layer. Said light-emitting apparatus with

light-emitting element with emission wavelength in the range 360 nm to 550 nm and with said lower limits clearly pertain to the invention as disclosed in the Specification and hence pertain to the invention (see Example 9 for light-emitting apparatus with light-emitting element with emission wavelength and weight percentages in the claimed range); said limitations thus easily could have been claimed in 6,632,379.

Furthermore, said reflection layer would have been obvious over Ellens et al (US 2003/0052595 A1), who, in a patent drawn to a light-emitting apparatus with light-emitting element with emission wavelength in the range as claimed, and with sialon phosphor (see e.g. abstract and paragraphs [0004]-[0005]), hence analogous art, teach the inclusion of a light reflection layer 17 (see [0025]). *Motivation* to include the teaching by Ellens in this regard is the improved efficiency in the use of the primary light reflected by said reflection layer, through an increase in the path length through said phosphor and through improved focus of light emission.

Said reflection layer would also have been obvious over Takahashi et al (US 2002/0043926A1), who, in a patent drawn to a light-emitting apparatus with light-emitting element with emission wavelength in the range as claimed, and with sialon phosphor (see e.g. abstract), hence analogous art, teach the inclusion in the light-emitting element of a light reflection layer 25 between the light-emitting layer 14 and the substrate 11 (see [0077]-[0078] and Figure 3). *Motivation* to include the teaching by Takahashi et al in this regard is the improved efficiency in the use of the primary light reflected by said reflection layer, through an increase in the path length through said phosphor and through improved focus of light emission.

Claim 2 in 6,632,379 verbatim adds to claim 1 therein the same limitation as claim 13 adds to claim 1 in the current Application except for a difference in the upper limit of the parameter 'c'. The claims are clearly drawn to the same invention, with the limitation on 'c' being anticipated by the patent.

5. **Claim 27** is provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claim 12 of copending Application No. 11/717,050 in view of either Ellens et al (previously cited) or Takahashi et al (US 2003/0052595 A1). Claim 12 (through independent claim 1) recites all limitations of claim 27 except on reflection layer.

However, it would have been obvious to include said limitation in view of Ellens et al, who in a patent drawn to a light-emitting element with sialon phosphor (see e.g. abstract and paragraphs [0004]-[0005]), hence analogous art, teach the inclusion of a light reflection layer 17 (see [0025]). *Motivation* to include the teaching by Ellens in this regard is the improved efficiency in the use of the primary light reflected by said reflection layer, through an increase in the path length through said phosphor and through improved focus of light emission.

It also would have been obvious to include said limitation in view of Takahashi et al, who in a patent drawn to a light-emitting element with sialon phosphor (see e.g. abstract), hence analogous art, teach the inclusion in the light-emitting element of a light reflection layer 25 (see Figure 3) between the light-emitting layer 14 and the substrate 11 ([0077]-[0078]). *Motivation* to include the teaching by Takahashi et al in this regard is the improved efficiency in the use of the primary light reflected by said reflection layer,

through an increase in the path length through said phosphor and through improved focus of light emission.

This is a provisional obviousness-type double patenting rejection.

6. **Claim 27** is rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claim 1 of U.S. Patent No. 6,632,379 B2 (to Mitomo et al) in view of either Ellens et al (previously cited) or Takahashi et al (US 2002/0043926 A1).

Said claim 1 in 6,632,379 recites all limitations of claim 27 except on reflection layer and on light-emitting apparatus with light-emitting element with emission wavelength in a range of 360 to 550 nm (in which the claimed phosphor is comprised). However, said light-emitting apparatus with light-emitting element in the range of 360 nm to 550 nm, particularly, as taught in Example 9 clearly are aspects of the invention by Mitomo et al (6,632,379 B2) (see col. 11).

Furthermore, it would have been obvious to include said limitation on reflection layer in view of Ellens et al, who in a patent drawn to a light-emitting element emitting light in an overlapping wavelength range (see their abstract and claim 1) with sialon phosphor (see e.g. abstract and paragraphs [0004]-[0005]), hence analogous art, teach the inclusion of a light reflection layer 17 (see [0025]). *Motivation* to include the teaching by Ellens in this regard is the improved efficiency in the use of the primary light reflected by said reflection layer, through an increase in the path length through said phosphor and through improved focus of light emission.

It also would have been obvious to include said limitation on reflection layer in view of Takahashi et al, who in a patent drawn to a light-emitting element emitting light with sialon phosphor (see e.g. abstract), hence analogous art, teach the inclusion of a light reflection layer 25 (see Figure 3) between the light-emitting layer 14 and the substrate 11 ([0077]-[0078]). *Motivation* to include the teaching by Takahashi et al in this regard is the improved efficiency in the use of the primary light reflected by said reflection layer, through an increase in the path length through said phosphor and through improved focus of light emission.

Response to Arguments

Applicant's arguments filed 7/16/07 have been fully considered but they are not persuasive. Specifically:

(a) With regard to the traverse of the objection to the Specification and the rejection under 35 USC 112, first and second paragraphs:

Applicant's argument is that [0153] merely describes that the composition of the claimed invention can be considered to be within the three lines shown in Figure 5 is not persuasive because a fair reading of paragraphs [0150]-[0152] justifies "the chemical composition" as disclosed in [0153] to be the same chemical composition as disclosed in [0150], except defined differently, which, as shown by the calculation in the previous Office Action, leads to a contradiction. That indeed said "chemical composition" of [01053] is the one disclosed in [0150] is confirmed by applicant's own claim 13 because claim 13 depends on claim 1. Therefore, the objection to the Specification and the rejections under 35 USC 112, first and second paragraphs of claim 13 must stand.

(b) With regard to the traverse of the "Prior Art Rejections":

Applicant's argument that the reflector of Ellens is not part of the light emitting element does not do justice to the broadest possible interpretation of light-emitting element as used by those skilled in the art of semiconductor light-emitting devices, as witnessed also by Ellens et al, who describe their light-emitting element to include leads 2 and 3 and hence also the horizontal portions of the reflecting wall of the recess: see the cited paragraph [0025], particularly "the light source is a semiconductor component (chip 1) of type InGaN, with a peak emission wavelength of 400 nm, having a first and second electrical connection 2, 3", where it is noted that light emitting element and light source are synonymous in the art of semiconductor solid-state light-emitting devices. Therefore, in a broad interpretation of the claim language on record at the time, the reflecting wall of Ellens et al meets "reflection layer" as previously claimed.

(c) With regard to the newly added claims 28-32, it is noted that claims 30 and 31 depend on withdrawn claims, and hence themselves are being withdrawn from consideration. Claims 28, 29, and 32 have been examined at the earliest possible time. Prior Art in the form of Takahashi et al has come to light over which said claims must be rejected, with reference to the rejections overleaf.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Johannes P. Mondt whose telephone number is 571-272-1919. The examiner can normally be reached on 8:00 - 18:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jack W. Keith can be reached on 571-272-6878. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.


Art Unit: 3663

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JPM

September 22, 2007

Primary Patent Examiner:


Johannes Mondt (TC3600, Art Unit: 3663)